CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO.
WASTE DISCHARGE REQUIREMENTS
FOR
SYNGENTA SEEDS, INC.
WOODLAND SEED PROCESSING FACILITY
YOLO COUNTY

The California Regional Water Quality Control Board, Central Valley Region (hereafter Regional Water Board), finds that:

1. Syngenta Seeds, Inc. (hereafter known as Discharger) submitted a Report of Waste Discharge (RWD) dated 2 November 2004 to obtain Waste Discharge Requirements (WDRs) for the discharge of seed processing wastewater at its facility at 21435 County Road 98 in Woodland. RWD addenda were submitted on 30 September 2005 and 2 October 2006; and annual self-monitoring reports were voluntarily submitted on 15 December 2005, 15 December 2006, and 17 December 2007.

2. The Syngenta Seeds, Inc. facility is in Section 18, T9N, R2E MDB&M as shown on Attachment A, which is attached hereto and made part of the Order by reference. The processing plant and surrounding cropland, which are owned by the Discharger, are on Assessor's Parcel Number 041-030-14.

Existing Facility and Operations

3. In April 2004, the Yolo County Environmental Health Department discovered that Syngenta Seeds, Inc. was discharging process wastewater to a drainage ditch that flows to Willow Slough, and referred the Discharger to the Regional Water Board to obtain WDRs. The facility has been in operation since 1972, and had been discharging process wastewater to leachfields and an adjacent drainage ditch that drains to Willow Slough. The Discharger ceased the discharge to surface waters on request and began land-applying wastewater in accordance with an interim operations plan submitted in June 2004 pending adoption of WDRs. There have been no complaints about the Discharger's operations since the original referral by Yolo County.

4. The Discharger has made several operational improvements related to the land discharge of wastewater since the RWD was originally submitted. Specifically, outdoor processing was consolidated into a single area, a finer wastewater screen was installed, the wastewater land application area was expanded, a sprinkler irrigation system was installed, and perennial grass was planted in the wastewater land application area. These changes have reduced waste constituent loadings.

5. The Discharger grows a variety of seed crops (peppers, tomatoes, watermelons, cantaloupe, and squash) on approximately 130 acres of a 160-acre parcel 1.5 miles south of Woodland. Some crops are also grown in greenhouses. The amount of fruit processed each year has varied from 88 to 173 tons for the last three years. The total annual

discharge to the wastewater land application area ranged from 197,000 to 400,000 gallons per year for the last four years.

6. Both field-grown and greenhouse crops are drip irrigated. Beginning in July and continuing intermittently through October, the crops are harvested and processed to remove their seeds. The fruits are mechanically crushed. Coarse solids, such as fruit rinds, are removed and stored temporarily in a bin. The seeds are removed, and the remainder of the fruit (small pieces of rind, skin, pulp, and juice) is flushed into the process wastewater drain by a flume. Antimicrobial solutions are added to the wet seeds before they are placed in rotating drum dryers. Once dry, the seeds are transferred indoors, where they may be further treated with antifungal agents prior to packaging. The seeds produced at the Discharger's facility are ultimately used at other farms to create hybrid strains, which are also harvested for seed that is sold to farmers for crop production.

7. Seed processing takes place outdoors on approximately 4,000 square feet of concrete slabs that drain to a 1,000-gallon septic tank. Another 1,600-square foot slab is used for washing and sterilization greenhouse seedling trays. It also drains to the 1,000-gallon septic tank. Attachments B and C, which are attached hereto and made part of the Order by reference, depict the facility and drainage features.

8. Float switches in the 1,000-gallon septic tank control a submersible pump that conveys the process wastewater to 0.020-inch screen, which discharges to a 3,000-gallon septic tank. Screened wastewater is pumped to the wastewater land application area. The pump in the larger septic tank is also controlled by float switches. Standby trash pumps are available if any of the septic tank pumps fail. Screened solids are collected in a bin for land application with the other residual solids.

9. Several greenhouses are used to grow seedlings and mature plants whose seeds are used for research (Attachment C). All of the greenhouses have evaporative cooling systems that are used to prevent the temperature from rising above about 90 degrees Fahrenheit. Most of the greenhouse cooling systems are closed loop systems with no waste discharge. However, six 2,800-square foot greenhouses generate small volumes of saline wastewater that is drained from the system to reduce salt accumulation on the cooling pads. Sulfuric acid is added to the cooling system supply reservoirs to control mineral scaling. The greenhouse cooling system wastewater is conveyed by aboveground tubing and pipes to a 2,000-gallon trailer-mounted tank, which is periodically dumped into the 3,000-gallon septic tank.

10. The RWD estimates that no more than 500 gallons of wastewater are generated each year by the greenhouse cooling systems, but observations made during a 7 March 2008 facility inspection indicate that this waste stream may be up to several hundred gallons per day (gpd) during warm weather. Based on data for two grab samples tested in 2004, the character of the greenhouse wastewater is summarized below.

Constituent/Parameter	Units	Range of Results
Biochemical oxygen demand	mg/L	<0.2
Total dissolved solids	mg/L	2,044 to 2,314
Fixed dissolved solids	mg/L	1,912 to 1,956
Ammonia nitrogen	mg/L	<0.1
Total Kjeldahl nitrogen	mg/L	3.2 to 4.5
Nitrate + nitrite nitrogen	mg/L	34 to 34.3
Total nitrogen	mg/L	37.2 to 38.8
Calcium	mg/L	35 to 55
Chloride	mg/L	185 to 215
Magnesium	mg/L	201 to 277
Sodium	mg/L	297 to 304

These results indicate high salinity due to evapoconcentration of the supply water. Based on analytical results for the facility's water supply, which are discussed below, the nitrogen content of this waste stream is also likely due to evapoconcentration of nitrate present in the water supply.

11. The combined process and greenhouse wastewater is pumped from the 3,000-gallon septic tank to a 1.6-acre wastewater land application area, where it is applied by rainbird-type sprinklers to seven irrigation checks. Flow to each check is controlled by manual valves. The checks were recently planted with perennial rye grass, which requires more water than the typical wastewater flow, particularly in the spring, when little or no wastewater is available. The Discharger adds supplemental fresh water as needed to sustain the grass, which is periodically mowed. Under current operations, the cuttings are not removed. However, it is appropriate for this Order to require regular harvesting and removal to prevent nitrogen and salinity build-up in the soil.

12. After the processing season ends in late October, the concrete slabs, sumps, and pipelines are flushed with clean water. This rinse water is discharged to the land application area. A valve in the pipeline between the 1,000- and 3,000-gallon septic tanks is closed, allowing subsequent storm water runoff from the outdoor processing areas to drain to a surface water drainage ditch along the southern property boundary.

13. Various chemicals are used to treat the seeds to control microbial diseases and sterilize seedling trays used in the greenhouses. Estimated usage rates are summarized below.

Chemical	Concentration (percent)	Annual Usage (gallons per year)
Pectinase [1]	NA	50
Tsunami ® [2]	NA	4 to 8

Chemical	Concentration (percent)	Annual Usage (gallons per year)
Physan 20™ [3]	NA	4
Trisodium phosphate (TSP)	10	50
Chlorine	10	30
Sodium hypochlorite	1	40
Sodium hypochlorite	5	200
Sodium hypochlorite	12.5	50
Hydrochloric acid	1	40
Hydrochloric acid	3	100
Muriatic acid	31	80 to 120

[1] An enzyme that hastens the breakdown of plant cell walls.
[2] An antimicrobial agent used on seeds that contains 31% acetic acid, 11% hydrogen peroxide, and 15% peroxyacetic acid.
[3] A quaternary ammonium compound mixture used as a microbiocide on seeds and for seedling tray sterilization.
NA Not applicable.

14. Based on analytical data submitted with the RWD and annual monitoring reports for 2005, 2006, and 2007, the character of the combined process and greenhouse wastewater is summarized below.

		Mean Analytical Result			
Constituent/Parameter	Units	2004 [1]	2005 [1]	2006	2007
Biochemical oxygen demand	mg/L	844	574	836	1,322
Electrical conductivity	umhos/cm	--	1,611	1,264	1,264
Total dissolved solids	mg/L	1,820	2,813	2,550	2,089
Fixed dissolved solids	mg/L	1,108	987	943	797
Ammonia nitrogen	mg/L	17	25	27	46
Total Kjeldahl nitrogen	mg/L	62	75	130	169
Nitrate + nitrite nitrogen	mg/L	5	18	9	<0.2
Total nitrogen	mg/L	67	93	139	169
Calcium	mg/L	56	44	47	47
Chloride	mg/L	179	203	204	122
Magnesium	mg/L	58	58	75	75
Sodium	mg/L	99	89	89	89

[1] Excludes greenhouse wastewater, which was formerly used for on-site dust control.
-- Not analyzed.

These data indicate that the wastewater is typically high in degradable organics, nitrogen, and salinity.

15. The Discharger proposes a flow limit of 493,000 gallons per year for the combined process and greenhouse wastewater, which is equivalent to 11 inches of water applied to the 1.6-acre land application area each year.

16. Based on a wastewater flow rate of 493,000 gallons per year averaged over 49 days of operation, an average BOD concentration of 944 mg/L, and a typical 8-day application cycle, the cycle average BOD loading would be approximately 50 pounds per acre per day, and the peak (or instantaneous maximum) BOD loading would be approximately 396 pounds per acre per day. However, due to highly variable daily flows and BOD concentrations, actual BOD loadings in 2007 were as high as 70 pounds per acre per day as a cycle average, and 1,100 pounds per acre per day as a peak daily rate. Because the wastewater is screened, there is minimal potential for accumulation of solids on the ground surface. Additionally, sprinkler application aerates the wastewater as it is being applied, and the typical water application rates have been low enough to prevent ponding on the ground surface. Therefore, a high peak daily loading rate may not necessarily cause nuisance conditions, particularly if it occurs infrequently. The Discharger may be able to reduce the peak daily loading rate by correlating historical BOD concentrations for the type of fruit processed to determine when lower application volumes and shorter cycles are needed to reduce the peak BOD loading.

17. At the proposed flow limit, a total of 11 inches of wastewater with an average total nitrogen concentration of 110 mg/L will be applied each year, resulting in a total nitrogen load of 280 pounds per acre per year. The nitrogen actually available to the crop (plant available nitrogen or PAN) will be less than the total nitrogen applied because of ammonia volatilization and denitrification within the root zone. Based on the historical ammonia and organic nitrogen content of the wastewater and the use of sprinklers, PAN may be as low as 83 percent of the total nitrogen or approximately 224 pounds per acre per year. Typical nitrogen requirements for turf grasses are 225 to 260 pounds per acre per year. However, crop nitrogen removal can only be realized if the crops are harvested and removed from the site.

18. The Discharger has designated a land application expansion area (Attachment B). The Discharger will review the previous year's monitoring data prior to the start of each processing season. If needed to comply with the loading rate limitations of this Order, the Discharger will add new irrigation areas and sprinklers systems before the next processing season begins. If wastewater concentrations are similar to previous years, full expansion up to 3.0 acres of land application area should reduce the BOD loading rate to 26 pounds per acre per day as a cycle average, and 634 pounds per acre per day as a peak daily rate. The water loading rate would be about 6 inches per year, and the nitrogen loading rate would be similarly reduced.

19. Fruit rinds, skins, and solids removed in the processing area, and by the wastewater screen, are collected in bins at each location. Based on recent annual processing totals, if

95 percent of the harvested fruit mass is land applied in solid form, approximately 190 tons of solids are applied to the Discharger's cropland each year. A manure spreader is used to apply the solids to the fields, and they are disked within several days to incorporate the waste. The RWD did not provide characterization data for this waste, but it is expected to contain high concentrations of readily degradable organic matter and nitrogen. There is currently no specific land application area or rotation schedule for this discharge, and the RWD did not provide any information regarding typical solids loading rates. Because of the potential for nuisance conditions associated with readily degradable organic matter on the ground surface and groundwater degradation associated with the nitrogen content of this waste, it is appropriate to require that the Discharger submit a *Solids Management Plan* for review and approval.

20. Domestic wastewater generated at the facility is discharged to a septic system permitted by the Yolo County Environmental Health Department. Three small reverse osmosis systems are used for water supplied to the office, laboratory, and a small boiler. The 330-pounds per hour boiler supplies steam to a small autoclave, which is used to sterilize growing medium. The autoclave is not in continuous use, and the boiler is operated only when the autoclave is in use. The reverse osmosis brine and boiler blowdown are discharged to the septic system. The laboratory is used for visual and microscopic examination of plant tissues and culturing of potential plant pathogens. No chemical analyses are performed.

Site-Specific Conditions

21. The facility and Discharger's cropland are relatively flat at an approximate elevation of 63 feet above mean sea Level (MSL).

22. Storm water runoff from the entire site drains to north-south trending ditches that discharge to a main drainage ditch along the southern boundary of the site. This ditch also receives storm water runoff and tailwater runoff from nearby farms. A sloped roadway along the north side of the main drainage ditch prevents runoff from entering the ditch by overland flow. Based on the topography of the land application site and the method of land application, there should be no irrigation tailwater if the checks are well managed. However, storm water runoff from the wastewater land application area would drain to the ditch. There is some potential for discharge of contaminated storm water runoff from the land application area because the wet season may begin in October and the processing season can extend through the end of that month. However, since the Discharger cannot discharge immediately before, during, or immediately after storm events, the potential for discharge of significantly contaminated storm water would be minimal.

23. Because the Discharger uses sprinkler irrigation on the wastewater land application area and drip irrigation in the fields and greenhouses, there is essentially no tailwater discharge from the site.

24. The processing facility and land application areas are outside of the 100-year flood plain.

25. Subsurface soils at the site are primarily Capay silty clay with small areas of Sycamore silty clay loam and Marvin silty clay loam. The Sycamore silty clay loam, which is found at the processing and wastewater land application areas, is described by the Natural Resource Conservation Service as poorly drained with low permeability.

26. Soil sampling was performed at wastewater land application site in September 2006. The results of that sampling are summarized below.

	Analytical Results					
	Soil Solids				Saturated Paste	
Sample ID and depth	Total Alkalinity [1]	CEC [2]	N [3]	TDS [4]	EC [5]	pH
SB 1						
(0.5-2 ft)	5,175	30.6	1,496	1,320	1,127	7.83
(2.5- 4.0 ft)	6,350	33.9	2,280	1,800	979	7.92
SB 2						
(0.5-2 ft)	5,200	33.4	1,467	624	657	8.37
(5.5-7.0 ft)	9,550	35.4	2,037	1,500	779	8.44
SB 3						
(0.5-2 ft)	5,475	35.5	1,452	930	634	8.47
(5.5-7.0 ft)	6,925	33.0	1,603	1,584	726	8.40

[1] mg/Kg as $CaCO_3$.
[2] Cation exchange capacity, meq/100 gm.
[3] Total nitrogen, mg/Kg.
[4] Total dissolved solids, mg/Kg.
[5] Electrical conductivity, umhos/cm.

These data indicate that the soil is slightly alkaline and has good pH buffering capacity. The cation exchange capacity and pH are typical of silty clay soils.

27. The average annual precipitation in the Woodland area is 17.28 inches and the 100-year total annual precipitation is 31.42 inches.

28. The reference evapotranspiration rate (ET_0) for the area is approximately 52 inches per year, and approximately 26 inches of the ET_0 typically occurs from July through October when the discharge occurs.

29. The crop coefficient for turf grasses is approximately 0.8, resulting in an irrigation demand of approximately 24 inches per year in an average rainfall year.

30. Surrounding land uses are agricultural, and no residences are nearby.

31. Process water is supplied from an on-site well. Analytical results for five samples obtained between April 2004 and August 2007 are summarized below.

Constituent/Parameter	Units	Mean Result
Biochemical oxygen demand	mg/L	5
Total dissolved solids	mg/L	528
Fixed dissolved solids	mg/L	441
Electrical conductivity	umhos/cm	988
Hardness (as $CaCO_3$)	mg/L	225
Ammonia nitrogen	mg/L	0.27
Total Kjeldahl nitrogen	mg/L	0.8
Nitrate nitrogen	mg/L	7.5
Total nitrogen	mg/L	11.1
Boron	mg/L	1.4
Calcium	mg/L	34
Chloride	mg/L	58
Magnesium	mg/L	51
Sodium	mg/L	89

Groundwater Considerations

32. Based on groundwater elevation contour mapping developed by the Department of Water Resources for Spring 1997, shallow groundwater may be found at approximately 40 feet MSL (about 25 feet below the ground surface).

33. There are no shallow groundwater monitoring wells at the site, but the Discharger completed a limited assessment of groundwater quality beneath the wastewater land application area in September 2006. Groundwater analytical data obtained from three temporary well points are summarized below. The groundwater sampling locations are depicted on Attachment B.

		Analytical Result			Lowest Water Quality Goal [1]
Constituent/Parameter	Units	SB 1	SB 2	SB 3	
Total dissolved solids	mg/L	693	1055	1391	450 [2]
Fixed dissolved solids	mg/L	535	875	1164	NA
Ammonia nitrogen	mg/L	<0.1	<0.1	<0.1	1.5
Total Kjeldahl nitrogen	mg/L	<1	<1	4.45	NA
Nitrate nitrogen	mg/L	43.6	52.1	57.7	10

Constituent/Parameter	Units	Analytical Result SB 1	SB 2	SB 3	Lowest Water Quality Goal [1]
Total nitrogen	mg/L	43.6	52.1	62.2	NA
Bicarbonate alkalinity	mg/L	400	492	597	NA
Calcium	mg/L	29.0	35.6	34.3	NA
Chloride	mg/L	32.5	77.5	65.0	106 [2]
Magnesium	mg/L	63.2	79.3	70.7	NA
Sodium	mg/L	180	305	324	69
Sulfate	mg/L	145	294	205	250 [2]
Manganese	mg/L	<0.01	<0.01	<0.01	0.05
Iron	mg/L	<0.10	0.21	0.19	0.30

[1] Refers to the most stringent of the potentially applicable water quality goals for protection of the beneficial uses of groundwater. Actual receiving water (groundwater) limits may be higher or lower depending on site-specific conditions and compliance with applicable Basin Plan policies.

[2] These parameters are indicative of the salinity of the discharge. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of water for human consumption. EC is a general indicator of the other salinity constituents. The secondary MCL for EC is 900 umhos/cm as a recommended level, 1600 umhos/cm as an upper level, and 2200 umhos/cm as a short-term maximum. Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985) indicates that irrigation with water with an EC of 700 umhos/cm is protective of salt sensitive crops. Most other crops can tolerate higher EC concentrations without harm. However, as the salinity of the irrigation water increases beyond 700 umhos/cm, more crops are potentially harmed by the EC, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

These data indicate that groundwater beneath the site exceeds water quality objectives for electrical conductivity, dissolved solids, nitrate nitrogen, and sodium. Because the land discharge has been ongoing for only four years at relatively low water application rates, it appears that the degradation is likely due to agricultural practices in the area. Based on the limited volume of the discharge, the seasonal nature of the discharge, the character of the waste, and site-specific soil and groundwater conditions, discharge has minimal potential to further degrade groundwater quality. Therefore, groundwater monitoring is not necessary unless the discharge changes significantly or new information regarding the threat to groundwater quality becomes available. However, it is appropriate to require that the Discharger not allow the salinity of the wastewater to increase, and to require that the Discharger develop and begin to implement a salinity minimization plan.

Other Considerations for Food Processing Waste

34. Excessive application of food processing wastewater to land application areas can create objectionable odors, soil conditions that are harmful to crops, and degradation of underlying groundwater by overloading the shallow soil profile and causing waste constituents (organic carbon, nitrate, other salts, and metals) to percolate below the root

zone. Ordinarily, it is reasonable to expect some attenuation of various waste constituents that percolate below the root zone within the vadose (unsaturated) zone. Specifically, some excess nitrogen can be mineralized and denitrified by soil microorganisms, organic constituents (measured as both BOD and volatile dissolved solids) can be oxidized, and some salinity species will undergo cation exchange with clay molecules, effectively immobilizing them.

35. According to *Pollution Abatement in the Fruit and Vegetable Industry*, published by the United States Environmental Protection Agency (US EPA Publication No. 625/3-77-0007) (hereafter *Pollution Abatement*), in applying food-processing wastewater to land for biological treatment, the loading of BOD_5 should not exceed 100 lbs/acre/day (as a cycle average) to prevent nuisance odors. Limiting the cycle average BOD loading to 100 lbs/acre/day coupled should effectively prevent such odors.

    Irrigation with high strength wastewater results in high BOD loading on the day of application. If the rate of oxygen transfer into the soil is not adequate, resulting anaerobic soil conditions can mobilize soil metals such as iron and manganese, which migrate to groundwater. The California League of Food Processors *Manual of Good Practice for Land Application of Food Processing/Rinse Water* recommends an oxygen transfer model to determine acceptable total oxygen demand (biological plus nitrogenous oxygen demand) loading rates. Although the model is detailed and supported in the literature, a site-specific model was not included in the RWD. Therefore, it is appropriate to limit the peak daily BOD loading to the maximum allowable cycle average loading multiplied by the length of the cycle. The discharger uses a typical cycle length of eight days, so it is appropriate to limit the peak daily BOD loading to 800 lb/ac/day. This should be achievable with careful management of the wastewater land application area.

36. Acidic and/or reducing soil conditions can be detrimental to land treatment system function, and may cause groundwater degradation. If the buffering capacity of the soil is exceeded and soil pH decreases below 5 or the soil becomes reducing, naturally occurring metals (including iron and manganese) may dissolve and degrade underlying groundwater. *Pollution Abatement* recommends that water applied to crops have a pH within 6.4 to 8.4 to protect crops. The pH of the process wastewater typically ranges from 4.0 to 6.0. However, because the turf grass is grown primarily to take up water and nitrogen, the low pH of the wastewater may not be a concern. Additionally, soil pH at the wastewater land application area is moderately alkaline. Therefore, the soils are expected to adequately buffer the discharge. Accordingly, this Order does not impose effluent limitations for pH.

37. Groundwater beneath the proposed new land application sites exceeds the most stringent of the potentially applicable water quality goals for protecting the beneficial uses of groundwater for several salinity constituents and nitrate. Based on monitoring data for the last four years, the average TDS concentration of the screened process wastewater is approximately 2,300 mg/L, the average FDS concentration is approximately 960 mg/L, the average electrical conductivity is approximately 1,400, the average sodium concentration is approximately 91 mg/L and the average chloride concentration is approximately 177 mg/L. Because of salts already present in the soil, evapoconcentration, leaching, and

limited potential for vadose zone attenuation to remove fixed dissolved solids, the proposed discharge could further degrade the underlying groundwater unless salinity loading to the land application sites is controlled. Because background groundwater quality is not currently known, it is not possible to determine an effluent limit for salinity that would be protective of groundwater quality. Therefore, it is appropriate to impose effluent limits that maintain effluent salinity at its current level until sufficient information is available to determine long-term salinity limits.

38. It is appropriate for this Order to impose effluent and groundwater limitations that are protective of groundwater quality. It is also appropriate to require that salinity reduction and control measures be implemented as needed to comply with those limitations, and that the Discharger monitor the effectiveness of all salinity reduction measures implemented. The Discharger may need to either increase the land application area or take other steps to reduce wastewater salinity to comply with the groundwater limitations of this Order.

39. Pursuant to California Water Code Section 13263(g), discharge is a privilege, not a right, and issuance of this Order does not create a vested right to continue the discharge. Failure to provide best practicable treatment and control; preclude conditions that threaten pollution, degradation, or nuisance; and protect groundwater quality will be sufficient reason to enforce this Order, modify it, or revoke it and prohibit further discharge.

Basin Plan, Beneficial Uses, and Regulatory Considerations

40. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition revised September 2004, (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board (State Board). Pursuant to Section 13263(a) of the California Water Code, waste discharge requirements must implement the Basin Plan.

41. Surface water drainage is to Willow Slough, which is tributary to the Yolo Bypass. The Basin Plan designates the beneficial uses of the Yolo Bypass as agricultural supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; migration of warm and cold water aquatic organisms; spawning, reproduction, and/or early development of warm water aquatic organisms; and wildlife habitat.

42. The beneficial uses of underlying groundwater are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

43. State Board Resolution No. 68-16 prohibits degradation of groundwater quality unless it has been shown that:

    a. The degradation is consistent with the maximum benefit to the people of the State;

    b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and

d. The discharger employs best practicable treatment and control to minimize degradation.

44. The Discharger has installed a finer wastewater screen, expanded the wastewater land application area, installed a sprinkler irrigation system, and planted perennial grass in the wastewater land application area. These changes have reduced waste constituent loadings to the wastewater land application area. The RWD did not specify any further plans to implement BPTC measures to reduce the salinity of the discharge. There are several other BPTC methods available to further reduce the potential for groundwater degradation, which the Discharger did not propose to implement. These include:

a. Obtain additional land to allow further dilution of the waste in combination with supplemental fresh water for crop irrigation; and

b. Segregation and separate handling of high-salinity waste streams.

The RWD did not present a sufficiently detailed analysis of discharge- and site-specific information to show that the discharge as proposed would not further degrade the underlying groundwater. Additionally, the RWD did not demonstrate that further degradation would not impact the beneficial uses of the groundwater, or that such degradation is in the best interest of the people of the State. Consequently, the Discharger has not provided the required demonstration pursuant to State Board Resolution No. 68-16 to be allowed to cause groundwater degradation, and therefore none is authorized.

45. Federal regulations for storm water discharges promulgated by the U.S. Environmental Protection Agency (40 CFR Parts 122, 123, and 124) require specific categories of facilities which discharge storm water to obtain NPDES permits. Based on the Standard Industrial Classification (SIC) code, the Discharger is not required to obtain coverage under the State Board's Water Quality Order No. 97-03-DWQ. The RWD describes certain storm water best management practices (BMPs). This order requires that those BMPs be implemented, and includes a prohibition against release of storm water runoff from the wastewater land application area to protect surface water quality.

46. Section 13267(b) of California Water Code provides that: *"In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposes to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of discharging, or who proposes to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports."*

The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. __ are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

47. The facility has been in operation since 1972, and its continued operation is therefore exempt from the provisions of the California Environmental Quality (CEQA).

48. The action to adopt revised waste discharge requirements for the facility is exempt from the provisions of CEQA in accordance with Title 14 CCR, Section 15301 because the facility predates CEQA, and the WDRs do not envision or permit expansion of, or significant changes to, the facility or its operations.

Public Notice

49. All of the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

50. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

51. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to Sections 13263 and 13267 of the California Water Code, Syngenta Seeds, Inc., its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

Note: Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.

A. Discharge Prohibitions:

1. Land application of wastewater[1] to areas other than those shown on Attachment B is prohibited unless expressly approved by the Executive Officer.

2. Bypassing any treatment system (including screens) is prohibited.

[1] For the purposes of these discharge requirements, "wastewater" means any liquid waste from seed processing, washing and sterilization of seedling trays, greenhouse cooling systems, and/or any other process that is discharged to the land application area.

3. Discharge of wastes to surface waters or surface water drainage courses is prohibited.

4. Discharge of irrigation tailwater from the wastewater land application area to any off-site area or drainage course is prohibited.

5. Discharge of waste classified as hazardous, as defined in Section 2521(a) of Title 23, CCR, Section 2510, et seq., (hereafter Chapter 15), or 'designated', as defined in Section 13173 of the California Water Code, is prohibited.

B. Discharge Specifications:

1. The total annual wastewater flow shall not exceed 493,000 gallons/year.

2. Objectionable odors originating at the facility (including the wastewater land application area and fields that receive residual solids) shall not be perceivable beyond the property limits.

3. As a means of discerning compliance with Discharge Specification No. 2, the dissolved oxygen content in the upper one foot of any tank that contains process wastewater will be considered.

4. The Discharger shall operate all systems and equipment to maximize treatment of wastewater and optimize the quality of the discharge.

5. The wastewater land application area shall be managed to prevent breeding of mosquitoes and other vectors. Specifically:

   a. All wastewater applied to land must infiltrate completely within 24 hours.

   b. Low-pressure pipelines, unpressurized pipelines, and ditches that are accessible to mosquitoes shall not be used to store wastewater.

6. All treatment, storage, and disposal facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

7. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.

8. The facility shall have sufficient treatment, storage, and disposal capacity to accommodate allowable wastewater flow and design seasonal precipitation. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

9. Neither the treatment nor the discharge of waste shall cause a condition of nuisance or pollution as defined by the California Water Code, Section 13050.

C. Effluent Limitations

1. The electrical conductivity of the wastewater (or wastewater combined with supplemental irrigation water) discharged to the land application area shall not exceed 1,500 umhos/cm as a flow-weighted yearly average.

2. The chloride concentration of the wastewater (or wastewater combined with supplemental irrigation water) discharged to the land application area shall not exceed 200 mg/L as a flow-weighted yearly average.

3. The maximum BOD_5 loading to each wastewater land application area irrigation check shall not exceed any of the following:

   a. 800 lbs/acre on any single day;

   b. 100 lbs/acre/day as a 8-day cycle average; and

   c. The daily and 8-day cycle average loading rate that ensures compliance with Discharge Specifications B.2 and B.9 and the Groundwater Limitations.

   Loading calculations shall be performed as specified in the attached Monitoring and Reporting Program No. __, which is a part of this Order.

4. The total nitrogen loading to each wastewater land application area irrigation check shall not exceed the agronomic rate for plant available nitrogen (PAN) for the type of crop to be grown, as specified in the most recent edition of the Western Fertilizer Handbook. PAN shall be calculated as 83 percent of the total nitrogen content of the waste plus the total nitrogen contribution from supplemental fertilizers. As described in Finding No. 17, PAN must not exceed 260 pounds per acre per year if turf grass is grown on the land application area.

D. Wastewater Land Application Area Specifications

1. Hydraulic loading of wastewater (and supplemental fresh water) to the land application areas shall be at rates designed to minimize percolation of waste constituents below the evaporative and root zones, except as needed to promote surface soil chemistry that is consistent with sustainable agricultural land uses.

2. The Discharger shall maximize use of the available land application area to minimize waste constituent loading rates.

3. Crops shall be grown on the land application area each year. Crops shall be selected based on nutrient uptake capacity, tolerance of anticipated soil conditions, water needs, and evapotranspiration rates. All crops shall be harvested and the cuttings removed from the land application area at least once per year.

4. At a minimum, there shall be a 7-day drying/resting period between wastewater applications.

5. The irrigation system shall be designed and managed to ensure even application of wastewater over each irrigation field and prevent the discharge of tailwater and overspray outside of the land application area.

6. Irrigation with wastewater shall not be performed within 24 hours before a predicted storm, during precipitation, or within 24 hours after the end of any precipitation event, nor shall it be performed when the ground is saturated.

7. If sprinkler systems are used, wastewater shall not be applied to land when the wind speed exceeds 30 mph.

8. The irrigation force main shall be completely flushed with fresh water immediately after cessation of operations for 24 hours or more.

9. There shall be no standing water in any portion of the land application area more than 24 hours after application of wastewater ceases.

10. The discharge shall not cause the buffering capacity of the soil profile to be exceeded nor shall it cause the soil to become reducing.

11. The Discharger shall provide and maintain the following setbacks for the wastewater land application area:

Setback Definition	Surface Irrigation Setback (feet)
Edge of irrigated area[1] to public property (e.g., street)	10
Edge of irrigated area to other agricultural property	5 [2]
Edge of irrigated area to occupied residence	50
Edge of irrigated area to irrigation well	50 [3]
Edge of irrigated area to domestic well	100 [3]

[1] As defined by the wetted area produced during irrigation.

[2] Unless off-site discharge is prevented by topography or berms. In such cases, no setback is required.

[3] Unless otherwise expressly approved by the Executive Officer.

12. Application of process wastewater shall only occur where the field and irrigation system are maintained to provide uniform water distribution, minimize ponding, and provide complete tailwater control.

13. If flood irrigation is used, check runs shall be no longer, and slopes shall be no greater, than that which permits uniform infiltration and maximum practical irrigation efficiency.

14. Tailwater ditches, if used, shall be maintained free of emergent, marginal, and floating vegetation.

15. Following the last day of processing, but **no later than 30 October each year**, the process area slabs shall be washed down to remove residual organic matter and the septic tanks shall be drained and cleaned.

E. Solids Disposal Requirements

1. If disposed of off-site, solids shall be disposed of in compliance with the *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. Collected screenings, sludge, and other solids applied to land shall be managed in accordance with an approved *Solids Management Plan* submitted pursuant to Provision G.1.b.

3. Any proposed change in solids use or disposal practice shall be reported to the Executive Officer by submittal of a revised *Solids Management Plan* at least 90 days in advance of the change.

4. Solids shall not be applied to land when the land application area is saturated.

5. Solids shall be applied at agronomic rates for nutrients, and the application rate shall be selected to prevent vector attraction and nuisance odors.

6. Solids shall be evenly applied and incorporated into the soil by disking as necessary to prevent nuisance conditions.

7. The total nitrogen loading to each solids land application area shall not exceed the agronomic rate for plant available nitrogen (PAN) for the type of crop to be grown, as specified in the most recent edition of the Western Fertilizer Handbook. PAN shall be calculated as 83 percent of the total nitrogen content of the waste plus the total nitrogen contribution from supplemental fertilizers.

F. Groundwater Limitations:

The discharge shall not cause underlying groundwater to contain any chemical constituent in concentrations greater than background groundwater quality.

G. Provisions:

1. The following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision G.3:

   a. By **30 November 2008**, the Discharger shall submit a *Solids Management Plan* that describes the specific loading rates, practices, application area(s), and operational procedures that will be used to ensure that the land application of waste solids does not cause nutrient overloading, nuisance odors, or promote vector breeding. The plan shall be based in part on solids monitoring data obtained during 2007.

   b. By **28 February 2009**, the Discharger shall submit and implement a *Salinity Evaluation and Minimization Plan* to address sources of salinity in the wastewater system. At a minimum, the plan shall include the following:

      i. An estimate of all of the pollutant sources contributing, or potentially contributing, to salinity in the process wastewater including water supply, water softeners, boilers, and chemicals used at the facility.

      ii. A description and analysis of methods that could be used singly or in combination to reduce the salinity of the process wastewater to 1,000 umhos/cm or less as a flow-weighted average, including innovative and alternative approaches. The analysis shall also identify sources of salinity that are not within the ability of the Discharger to control.

      iii. An estimate of salinity reduction that may be achieved through the methods identified in subparagraph ii.

      iv. A plan for monitoring the results of the salinity minimization program.

      v. A description of the tasks, costs, and time required to investigate and implement various elements in the plan. Include a specific schedule.

      vi. A statement of the Discharger's salinity pollution prevention goals and strategies, including priorities for short-term and long-term action, and a description of the Discharger's intended pollution prevention activities for the immediate future.

      vii. A description of the Discharger's existing salinity pollution prevention programs.

      viii. An analysis, to the extent feasible, of any adverse environmental impacts, including cross-media impacts or substitute chemicals that may result from the implementation of the salinity minimization program.

      ix. An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the salinity minimization program.

Progress in implementation of the plan shall be reported each year in the Annual Monitoring Report required pursuant to Monitoring and Reporting Program No. __.

2. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geological sciences, shall be prepared by, or under the direction of, persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1. To demonstrate compliance with section 415 and 3065 of Title 16, CCR, all technical reports, must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

3. The Discharger shall comply with Monitoring and Reporting Program No. __, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.

4. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

5. The Discharger shall submit to the Regional Water Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharge shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board in writing when it returns to compliance with the time schedule.

6. As described in the Standard Provisions, the Discharger shall report promptly to the Regional Water Board any material change or proposed change in the character, location, or volume of the discharge.

7. At least 90 days prior to termination or expiration of any lease, contract, or agreement involving the processing facility or land application areas that is used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Regional Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

8. In the event of any change in control or ownership of the facility or land application areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if

a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

9. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Violations may result in enforcement action, including Regional Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

10. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel at the facility shall be familiar with its contents.

11. The Regional Water Board will review this Order periodically and will revise requirements when necessary.

I, Pamela C. Creedon, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on __.

_____

PAMELA C. CREEDON, Executive Officer

ALO:08/18/2008